

Veterinary Considerations Concerning Smallpox Vaccination

The Vaccine

The current licensed smallpox vaccine in the United States, Wyeth Dryvax®, is a lyophilized, live-virus preparation of vaccinia virus prepared from calf lymph. The vaccine was made by using strain New York City calf lymph, derived from a seed virus of the New York City Board of Health (NYCBOH) strain of vaccinia virus that underwent 22 to 28 heifer passages. The vaccinia virus was inoculated, grown, then harvested from the skin of live calves. The new cell culture vaccines will also contain the NYCBOH strain of vaccinia.

Vaccinia vaccine does not contain the smallpox virus. However, because the vaccinia virus in the vaccine is "live," it can spread to other parts of the body or to other people from the vaccine site. This can be prevented through proper care of the vaccination site (e.g., handwashing and careful disposal of used bandages) until the vaccination site is healed (14–21 days after vaccination). Aerosol transmission of vaccinia does not occur.

Vaccinia virus is a member of the genus Orthopoxvirus. The other member of their genus (monkeypox, smallpox, and cowpox) can also infect humans causing cutaneous lesions, but only smallpox is readily transmitted from person-to-person. The origins of vaccinia virus are currently unknown. It may have arisen as a hybrid between cowpox virus and variola virus, it may have been derived from cowpox or some other Orthopoxvirus, or it may be a laboratory survivor of a virus now extinct in nature.

Veterinary Considerations

During the smallpox era, the only known reservoir for the smallpox virus was humans; no known animal or insect reservoirs or vectors exist.

Vaccinia virus infections in hand-milked dairy cattle formerly caused by exposure to recently vaccinated milkers have been reported during previous vaccination campaigns. In cows, vaccinia virus caused bovine vaccinia mammillitis, which was clinically indistinguishable from cowpox virus infection of the teats. Humans could be infected from this

source. Similarly, during the days of widespread smallpox vaccination, buffalopox was a relatively common disease in India and in other countries where water buffaloes were used as domestic animals. Buffalopox has persisted in India where outbreaks in buffalos and humans are considered to be due to infection with vaccinia virus or a separate subspecies of vaccinia virus.

Although the risk of transmission of the vaccinia virus from a recently immunized person to animals and the outcome in animals (e.g., clinical signs and symptoms, transmission potential to other animals or humans) are unknown, the use of the smallpox vaccine, either in a pre- or post-event, may have veterinary considerations. There are currently no restrictions for recently vaccinated individuals in regards to contact or handling of animals. However, if persons handling animals practice the same precautions that they would use to prevent spread to another person (e.g., cover the vaccination site with a loose dressing, wash hands after any contact with the site or dressing, not letting animals contact the vaccination site and scab or any clothing, sheets, or bandages that have been in direct contact with the vaccination site or scab), spread to the animal should be prevented.

Additional Information

For additional information on smallpox, see the following Centers for Disease Control and Prevention Web site: <http://www.bt.cdc.gov/agent/smallpox/>.

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